

Appendix C3 – Source Identification (Stormwater Management)

Stormwater Management Facilities



BMP Geodatabase December 2021 Submittal to MDE Technical Memorandum

Prepared for

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BMP Geodatabase Technical Memorandum

1 Introduction and Background

Harford County's (County) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit (Permit Number 11-DP-3310, effective 30 December 2014 through 29 December 2019) requires the County to conduct preventative maintenance inspections of all environmental site design (ESD) treatment systems and structural stormwater management practices on a triennial basis. As part of the MS4 annual report requirements, the County is required to populate and submit a geodatabase in compliance with the *Maryland Department of the Environment, National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4), Geodatabase Design and User's Guide* (May 2017). This geodatabase is referred to as the MDE MS4 Geodatabase in this document. The Maryland Department of the Environment (MDE) released an updated Draft Supplement to the Geodatabase Design and User's Guide in November 2021. EA has reviewed the documentation and has noticed significant changes to the MDE MS4 Geodatabase schema that will affect the County investment of populating this data and general workflow. For this submittal the County and EA are not applying the draft supplement guidance to the geodatabase design. The data in the MDE MS4 Geodatabase is used to assist MDE in calculating the Total Maximum Daily Load (TMDL) reductions to the Chesapeake Bay. The County is required to report annually to MDE documentation identifying the stormwater management practices inspected, the number of maintenance inspections, the number of follow-up inspections, the enforcement actions used to ensure compliance, and the maintenance inspection schedule in the MDE MS4 Geodatabase.

The MDE MS4 Geodatabase is not designed to assist in performing inspections of stormwater management infrastructure. The Harford County Department of Public Works, Watershed Protection and Restoration Office (MS4 Office) has developed a Best Management Practice (BMP) Geodatabase schema with the assistance of EA Engineering, Science and Technology Inc., PBC (EA) to assist with gathering the data for triennial inspection requirements.

The MS4 Office has been using Survey123 to complete the stormwater management triennial maintenance inspections since 2019. This development has spurred the need for a revised BMP geodatabase schema for use in the field by the Triennial Inspection team.

1.1 Purpose

The MS4 Office contracted EA to assist in the design of the HCBMP Geodatabase schema, populate the HCBMP Geodatabase, design and implement the ArcGIS Survey123 Triennial Inspection Application, and develop Extract Transform Load (ETL)/Script tools to transfer the HCBMP Geodatabase into the MDE MS4 Geodatabase.

The purpose of this Technical Memorandum is to:

1. Identify the user of the HCBMP Geodatabase in the County
2. Document HCBMP Geodatabase use
3. Document the HCBMP Geodatabase schema



4. Document the procedures and source data for the HCBMP Geodatabase data population
5. Identify data population rules
6. Document ETL/Script to transform the HCBMP Geodatabase into the MDE MS4 Geodatabase.

2 HCBMP Geodatabase Users

Stormwater management practices information is needed by various divisions within the Department of Public Works for various objectives.

2.1 Watershed Protection and Restoration Office (MS4 Office)

The MS4 Office is responsible for compiling the information from various divisions and departments of the County and reporting that information to MDE for NPDES MS4 compliance.

The NPDES MS4 permit requires the County to conduct preventative maintenance inspections of all ESD treatment systems and structural stormwater management practices on a triennial basis. As part of those inspections, the County is required to report annually to MDE documentation identifying the stormwater management practices inspected, the number of maintenance inspections, the number of follow-up inspections, the enforcement actions used to ensure compliance, and the maintenance inspection schedule in the MDE MS4 Geodatabase.

2.2 Division of Construction Management Inspection Bureaus

Stormwater management inspections are completed by two separate bureaus within the Department of Public Works, Division of Construction Management (Table 1). The Bureau of Construction Inspections completes stormwater management inspections for construction and 1-year post construction. The Bureau of Construction Inspections use EnerGov to track their inspections, as their workflow is centered around building permit issuances, construction management, and permit closure.

The Bureau of Stormwater Management completes stormwater management triennial maintenance inspections after the building permit has been completed and closed. The HCBMP Geodatabase schema design was developed for the Bureau of Stormwater Management's stormwater management triennial maintenance inspections.

Table 1: Stormwater Management Inspection Responsibilities

	Bureau of Construction Inspections	Bureau of Stormwater Management
Purpose	Inspections during construction and 1-year post construction inspection	Triennial maintenance inspections
Tracking	EnerGov	EnerGov currently; Transitioning to ArcGIS Survey123
Employees	Mike Davies	Mike Rist Christy Joyce



3 HCBMP Geodatabase Schema

The HCBMP Geodatabase schema was developed using ArcGIS Desktop software and is used to:

- manage the Bureau of Stormwater Management's triennial stormwater maintenance inspections
- MS4 permit compliance.

The HCBMP Geodatabase schema consists of 11 objects: 4 feature classes, 4 flat tables, and 3 relationships classes. Figure 1 is the expanded view of the HCBMP Geodatabase in ArcCatalog.

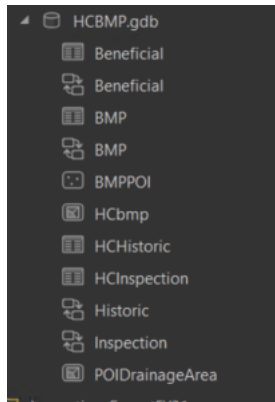


Figure 1: HCBMP Geodatabase

Table 2 lists the purpose of each object in the HCBMP Geodatabase.

Table 2: HCBMP Geodatabase Schema

Object Name	Type	Relationship With	Purpose
Beneficial	Flat Table	<i>HCBMP</i>	Record of the beneficial user of the BMP. Beneficial users are those who drain towards the BMPs. BMPs that have failed and do not have a responsible party to address the failure are billed by the County to recoup the cost. The billing is based on the percentage of the area draining to the BMP.
BMP	Flat Table	<i>HCBMP</i>	Record of additional information about the BMP that is not necessary for the triennial inspections but is required for the MDE MS4 Geodatabase.
BMPPOI	Point-Feature Class	<i>None</i>	POI is the point of interest for the POI Drainage Area. This feature class shows a specific geographical point indicating a study area or point of investigation (POI) in which there could be one or many Best Management Practices (BMPs) and includes



Table 2: HCBMP Geodatabase Schema

Object Name	Type	Relationship With	Purpose
			information associated with watershed, drainage area, and BMP construction. This feature class is not needed for the Triennial Inspection but is required for MDE Reporting.
Clusters	Polygon-Feature Class	None	A polygon around BMPs of the same type that drain to the same POI to allow for percentage of inspection to be performed and applied to the whole group. All BMPs within a Cluster Polygon will have the same MDE BMP number but different Local BMP numbers. The feature class is currently being improved.
HCBMP	Polygon-Feature Class	<i>Beneficial BMP</i> <i>HCHistoric</i> <i>HCInspection</i>	Footprint of the BMP and attributed based on the inspector's needs.
HCHistoric	Flat Table	<i>HCBMP</i>	Record of historic inspections pertaining to the BMP.
HCInspection	Flat Table	<i>HCBMP</i>	Record of maintenance inspections using new Survey123 application.
POIDrainageArea	Polygon-Feature Class	None	The drainage area to the point of interest, this feature class is not needed for the Triennial Inspection but is maintained for MDE Reporting.

4 HCBMP Geodatabase Population

4.1 Source Information

There are two types of stormwater management plans: engineered plans and standard plans. Both sets of plans are managed in EnerGov during the permitting process and given a Project Number. The acceptance of an As Built is managed by the Engineer Associate from the Bureau of Stormwater Management and recorded in an Excel sheet. The As-Built acceptance date is the date used to identify the fiscal year the stormwater management practice was accepted by the County. The As-Built plans are scanned and managed in a Laserfiche file system by Project Number and Project Name.

Engineer Plans

Engineer Plan permits require a construction bond and are typically used for large development projects. Upon construction completion and approval of the stormwater management As-Built plans, the construction bond is converted into a maintenance bond. The maintenance bond is released after a 1-year post-construction inspection is performed by the Bureau of Construction Inspections. The 1-year post-construction inspection is recorded in EnerGov since it results in



the release of a bond. After that 1-year post construction inspection is completed and accepted, the 3-year triennial inspection cycle starts. These are the plans that have been reviewed by EA and uploaded into the HCBMP Geodatabase.

Standard Plans

Standard Plan permits do not require a construction bond or maintenance bond. These plans are common for small single-family constructions. The Bureau of Construction Management completes the final inspection for standard plans concurrently with the As-Built acceptance. These plans have not been reviewed by EA and are not in the HCBMP Geodatabase at this time.

Property Information

Harford County Department of Planning and Zoning creates the cadastral layer and provides that to the Maryland State Department of Assessments and Taxation (SDAT). The cadastral layer is maintained on the County Spatial Database Engine (SDE) and is used to populate the property information (BMP Address, BMP City, BMP Owner). An SDAT link is in the HCBMP feature class. The SDAT link enables the Bureau of Stormwater Management to access the latest property information during their triennial inspections.

Management Company Information

Owners of the stormwater management practice hire companies that specialize in stormwater management maintenance to maintain the facility. These companies along with the owners receive a copy of the triennial inspection. The information about the management companies is provided by the Bureau of Stormwater Management.

4.2 Geometry Population

The As-Built are georeferenced using ArcGIS Pro, and the HCBMP polygon and POI Drainage Area are delineated from those plans. All BMPs are mapped despite providing water quality credit or not. BMPs that extend beyond property boundaries may be broken by the property line to account for the individual owners responsible for the maintenance of the BMP. Practices that are broken by the property line are grouped into one MDE BMP identification (ID) number and the Inspection of Cluster ESD Practice may apply (See Section 4.4). For development with more than one drywell on a single lot, the BMP Polygon is a multipolygon with the same BMPid and MDEid. The BMP POI location is the downstream point of the POI Drainage Area and is typically a study point in the stormwater design report.

BMP POI locations were selected to relate to overall major contributing watersheds within a Project, where stormwater management facilities and associated quality treatment and quantity control from the project are provided. Typically, these locations were established at the outfalls from ponds or large treatment practices and selected just outside of the watershed boundary. While there could be multiple sub-watersheds within the overall watershed to the POI, the intent was to set up major POI locations to report the overall impervious area treated, within the larger watershed (the total impervious area as treated by the multiple individual facilities within the larger watershed).

As time progresses and more projects are permitted, previous undeveloped areas, as well as the redevelopment of other properties, will result in the creation of new POI locations/



watersheds that could be located either within or partially within the mapped watershed assigned to a POI. This will create a “nesting” or overlap of the watersheds.

The new POI will report additional impervious areas being treated. For those locations where a modification to an existing facility is proposed, those facilities will be updated. Generally, modifications are based on the original treatment requirements and increased treatment requirements for the proposed project. These values are then documented to report the added impervious area treated in the new POI. Therefore, the nesting of the watersheds/POI will not cause a requirement to revise the earlier POI data.

4.3 Attribute Population

With the management of the stormwater BMP involving various divisions, it is important to note the sources and procedures for data population in the HCBMP Geodatabase. The following section identifies in more detail the source of information for each attribute.

4.3.1 Project Specific

For attribute population of the HCBMP, BMP POI, and POI Drainage Area feature classes and BMP table, project-specific data are required. The As-Builts provide the information below to populate the HCBMP Geodatabase objects identified above. The following attributes appear multiple times in various objects:

- ProjectNo
- ProjectName
- BMPTYPE
- BMPName
- NumBMP
- As-built Link
- ApprovedPlanLin
- PermitNo
- PermitApproval
- BMPasbuilt
- Planapproval
- yearconstructed

The layout of the object and the attributes in them is available in Appendix A. This information is populated at the same time as the geometry of the features classes is delineated.

4.3.2 Engineering Review

A Professional Engineer reviews the As-Builts and the stormwater design report to determine the PE addressed, PE required, and Impervious Area Treated at the BMP POI. This information is recorded in the BMPPOI feature class. The MS4 Office has also elected to record the volume of each BMP that volume is recorded in the BMP table. This information is recorded after the geometry is completed. The engineer also reviews the drainage area and BMP footprint to confirm the GIS data match the As-Builts.



4.3.3 Geospatial Calculations

The POI Drainage Area, HCBMP feature class, and BMP table require geospatial calculations. Table 3 identifies the HCBMP Geodatabase object, attribute, source data and geoprocessing tool used for geospatial calculations.

Table 3: HCBMP Geodatabase Geospatial Calculations

HCBMP.gdb Object	Attribute	Harford County GIS Source Data	Geoprocessing Tool
POI Feature Class	NORTH EAST	NA	Calculate geometry (X coordinate of Centroid, Y coordinate of Centroid)
	WATERSHED8DGT	Watershed8digit	Overlay
	WATERSHED12DGT	Watershed12digit	Overlay
	LAND_USE	Predominant	Overlay
	LU_COUNTY		
	PERMIT_NUM	NA	Field calculate (Current MDE Number)
HCBMP	BMPAddress	Cadastral	Overlay
	BMPCity		
	BMPZip		
	TaXID		
	TaxIDLink	SDAT website	Create link using TaxID and syntax
	Asbuilt Link	Laserfiche	Copy a link using Laserfiche and project number.
BMP Table	BMPClass	NA	Field calculate Structural or ESD based on BMP Type (Sql statement in the field calculator)
	BMPStatus	NA	Field Calculate (Active)
	ConPurpose	NA	Field Calculate (NEWD)
	BMP_Drain_Area	POIDrainageArea	Join POI Drainage Area and copy Drainage Area from POIDrainageArea

4.3.4 Numbering

The BMPPOI_ID field in the BMPPOI feature class and the BMP_DRAIN_ID field in the POIDrainageArea feature class are populated according to the fiscal year the As-Built was accepted by the County.

In the HCBMP feature class and the BMP table, the BMPid is populated sequentially.

In the BMP table, the MDEid is populated sequentially. An Excel sheet, HCBMP.gdb Numbering, is the official record of numbering system and is stored on Harford County's WRE



drive under GIS Projects. The Excel sheet is utilized to facilitate the population of the IDs and prevent duplicates.

4.4 Cluster Feature Class

The County has opted to group or cluster BMPs of the same type draining to the same POI for triennial inspections. In November 2019, the County adopted the Inspection of Clustered ESD Practices to apply this cluster inspection protocol. The cluster BMP will be revisited in FY2022.

4.5 Geodatabase QAQC Population Rules

To assist in standardized data population, specific rules were created. The rules are based on the County's Triennial inspection program and the MS4 Permit requirements. The QAQC rules, applicable feature classes, and exceptions are listed in Table 4.

Table 4: QAQC Rules

Feature Class	QAQC Rule	Exception
HCBMP POI Drainage Area	HCBMP must be inside the POI Drainage Area	The drainage areas for drywells, non-rooftop disconnect, or sheet flow to conservation areas is the rooftop unless the identified practice is part of a larger POI drainage area. Therefore, not all drywells, non-rooftop disconnect, or sheet flow to conservation area may be in the POI drainage area.
HCBMP	HCBMPs do not overlap	Not Applicable
POI Drainage Area	POI Drainage Areas does not overlap	Historically BMPs may be nested within another POI Drainage Area. Care is to be taken to remove these nested drainage areas.
BMP POI POI Drainage Area	BMP POI point is always outside of the POI Drainage Area	BMP POI for pervious pavement that is not associated with other BMPs is located inside at the centroid of HCBMP. BMP POI for sheet flow and drywell that is not associated with other BMPs is located outside of the POI Drainage Area and may not be immediately adjacent to the POI Drainage Area.
BMP POI Imp_Arces POI Drainage Area	BMP POI Imp_Arces attribute cannot be larger than BMP POI Drainage Area. (Note: Imp_Arces has units of acres and BMP POI Drainage Area has a shape size in square feet. Unit conversion is used to check and verify this rule.)	Not Applicable



5 HCBMP Geodatabase Population Status

As of December 2021, EA continues to review the As-Built plans and update the HCBMP Geodatabase. The table below is based on fiscal year (FY). The information in Table 5 is based on the BMP Table in the HCBMP Geodatabase as of 17 December 2021. The HCBMP polygon feature class has more records than are identified in Table 5, as EA has not reconciled all the historic GIS data with the BMP table entries.

Table 5: BMP Table Population Status

Fiscal Year MDE ID Number	BMPs	Number of As- builts	Source of input data	Reviewed
FY21	321	61	EA	EA (PE Complete)
FY20	233	71	EA	EA (PE Complete)
FY19	201	45	EA	EA (PE Complete)
FY18	205	47	EA	EA (PE Complete)
FY17	81	42	EA	EA (PE Complete)
FY16	149	44	Other Consultant	EA (GIS)
FY15	176	52	Other Consultant	EA (GIS)
FY14	152	33	Other Consultant	EA (GIS)
FY13	21	42	Other Consultant	EA (GIS)
FY12	29	41	EA	EA (GIS)
FY11	80	41	EA	EA (GIS)
FY10	87	44	EA	EA (GIS)
FY09	91	51	EA	EA (PE)
FY08	87	48	EA	EA (PE)
FY07	84	49	EA	EA (PE)
FY06	127	45	EA	EA (PE)
FY05	49	36	EA	EA (PE)
Fy04	42	29	EA	EA (PE)
FY03	82	50	EA	EA (PE)
FY02	34	32	EA	EA (PE)
FY01	49	36	EA	EA (PE)
FY00	23	23	EA	EA (PE)

Notations used in the table above specify the type of review completed.

- EA (PE Complete): a Professional Engineer reviewed the drainages to the POI, verified BMP locations and footprint, identified POI locations, and provided the calculations for PE addressed, PE Required, Impervious Acres Treated for each POI, and the ESDv for all the BMPs. This step was done after EA(GIS) review occurred, meaning the EA(GIS) review below was also completed for these fiscal years.



- EA (GIS): a GIS Analyst georeferenced the As-Built plans to delineate BMP locations, drainages, and POI locations. Attribute information for the ProjectNo, ProjectName, BMPtype, BMPname, Num_BMP, AsBuiltLink, ApprovedPlanLink, PermitNo, Permitapproval, BMPasbuilt, Planapproval, YearConstructed, BMPaddress, BMPcity, and BMPzip were populated from the As-Built plans. In addition the GIS Analyst assigned POI ID, Drainage Area ID Number, MDE ID Number, and BMP ID based on the years and sequentially added. A separate Excel sheet to facilitate the population of the IDs and prevent duplicates was maintained.
- EA(PE): PE initial review of the As-Built plans are complete, but the data still needs updated and fully QAQCed in the HCBMP Geodatabase. Any data in the geodatabase has not been QAQCed.

It is important to note the unpopulated features are decreasing as the fiscal year reviews are completed and updated in the HCBMP Geodatabase.

6. HCBMP Geodatabase Transformation

The HCBMP Geodatabase schema does not match the MDE MS4 Geodatabase. For the December 2021 submittal, EA is in the process of developing ETL tool to transform the data from the HCBMP Geodatabase to the MDE MS4 Geodatabase. The equations and data transformation of the HCBMP Geodatabase to the MDE MS4 Geodatabase, when complete, will be documented in this section.

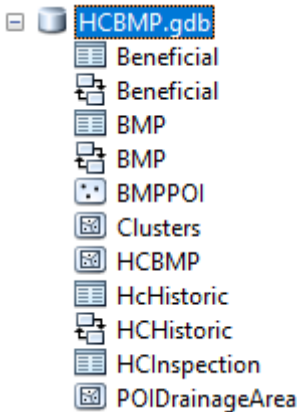


Appendix A – HCBMP Schema



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HCBMP Geodatabase – Schema August 2020



BMP Table – Related to HCBMP Many to One HCBMP		
Attribute	Description	Source
BMPid	Unique Harford County specific ID	Sequential
MDEbmpid	MDE unique ID	Sequential
BMPPOIID	BMPs POI’s unique ID	BMPPOIID
BMPDrainID	POI Drainage Area’s unique ID	POIDrainageArea
BMPTYPE	Using domain table from MDE Guidance May 2017	As-Built
BMPname	Name of the Project	As-Built
PermitNo	Using County Construction Permit System	As-Built
Permitapproval	When the construction permit was approved	As-Built
BMPasbuilt	Date of As-built	As-Built
PlanApproval	Date the plans were approved	As-Built
Complink	Link to the computations	Laserfiche
BMPClass	MDE required- ESD or Structural	As-Built
BMPStatus	MDE Required-Active	All BMPS recorded are active
BMPDrainageArea	The drainage area to the POI in acres	POIDrainageArea
Volume	Calculated ESDV to each BMP	Stormwater Design Report
Con_Purpose	MDE required – New development of redevelopment of site	All BMPs recorded are New Development

HCInspection - RelatedTable – Many Entries to One HCBMP		
Attribute	Description	Source
BMPID	Unique id for Harford County	Sequential number
InspectDate	Date of Inspection	Energov
Inspector	Name of Inspector performing inspections	Energov
InspectRating	Rating of inspection 0-4	Energov
Type	Type of Insection	Energov
Notes	Notes about the inspection	Energov
InspectionLink	Link to the pdf of inspection	Laserfiche

Clusters - Geometry Polygon		
Attribute	Description	Source
ClusterID	The id number for the clustered BMPs	GIS
Comments	Any specific notes about the cluster	GIS

HCBMP - Geometry Polygon One to Many BMP Table		
Attribute	Description	Source
BMPid	Unique id for Harford County	Sequential number
BMPTYPE	Using domain table from MDE Guidance May 2017	As-Built
Num_BMP	Number of BMPs of the same type to the same POI	As-Built
PermitNo	Using County Construction Permit System	As-Built
ProjectName	Project Name	As-Built
ProjectNumber	Project Number	As-Built
AsbuiltLink	Laserfiche location	Laserfiche
Year_Constructed	Year the BMP was constructed	As-Built/Aerials
BMPAddress	Closest physical address to BMP	GIS
BMPcity	The city the BMP is in	
BMPZip	The zip code the BMP is in	
PropertyType	Type of Property (Using domain table from MDE Guidance May 2017)	
ManagerCo	The Management company	Bureau of Stormwater Management
Ownership	HOA, Beneficial Users, No HOA	GIS
Ownername	Property Owner’s Name	
Ownercity	Property Owner’s City	
OwnerState	Property Owner’s State	
OwnerZip	Property Owner’s Zip Code	
TaxID	SDAT ID	SDAT
TaxIDLink	SDAT Link	SDAT
MaitenanceAgreement	Maintenance pdf	Bureau of Stormwater Management
ClusterID	The id number for the clustered feature class	GIS

BMPPOI-Geometry Point		
Attribute	Description	Source
BMPPOIID	POI’s unique ID	Sequential number based on Fiscal Year
MD_NORTH	Northing	GIS
MD_EAST	Easting	GIS
Land_Use	Predominant land use	GIS
LU_County	County unique land user (predominant)	GIS
Watershed8DGT	Maryland 8 digit hydrologic unit code	GIS
Watershed12DGT	USGS 12 digit hydrologic unit code	GIS
Imp_Acres	Impervious Acres	Stormwater Design Report
Last_Change	Date Field	
Permit_Num	Permit Number	MDE permit number
General Comments	Any important comments	GIS
PE_REQ	PE required	Stormwater Design Report
PE_ADR	PE addressed	Stormwater Design Report

POIDrainageArea - Geometry Polygon		
Attribute	Description	Source
BMP_Drain_ID	Unique ID	Sequential number based on Fiscal Year
BMPPOI_ID	POI’s unique ID	BMPPOI
BMPDrainageArea	The drainage area to the POI in acres	Field Calculated
Permit_Num	Permit Number	MDE permit number
Gen_Comments	Any important comments	GIS



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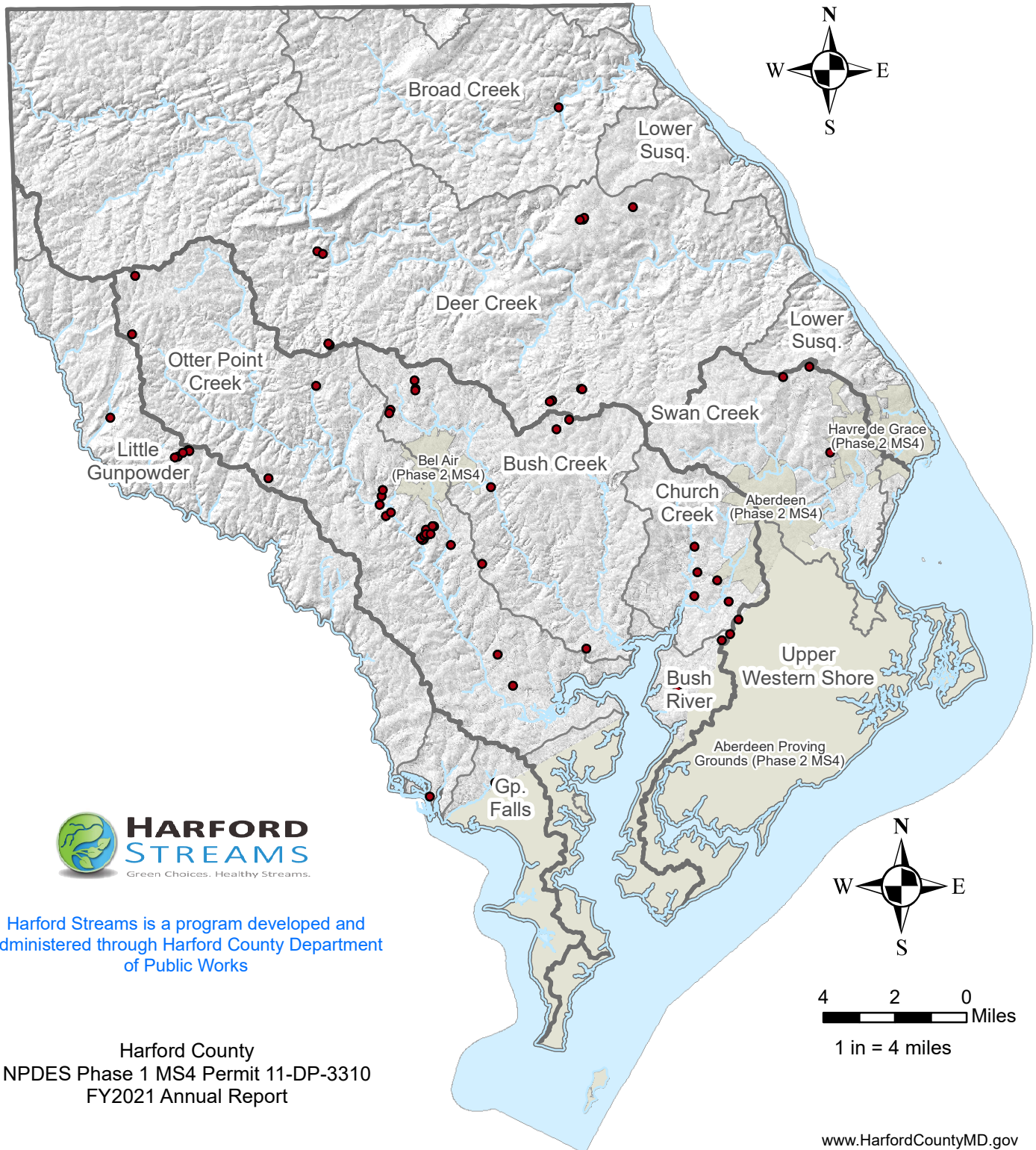
Appendix C3

Harford County, MD Department of Public Works Watershed Protection and Restoration

Stormwater As-builts (July 1, 2020 - June 30, 2021)



Barry Glassman
County Executive



Harford Streams is a program developed and
administered through Harford County Department
of Public Works

Harford County
NPDES Phase 1 MS4 Permit 11-DP-3310
FY2021 Annual Report

Harford County, MD Department of Public Works

Watershed Protection and Restoration

Stormwater Management Projects Asbuilt during Fiscal Year 2021 (MS4 Permit 11-DP-3310)



Barry Glassman
County Executive

PROJECT NAME	As-Built	MDE BMP ID	BMP Type
7-11 Bynum Rd At Rock Spring Rd	02/26/21	HA21BMP1080206	ConTech Storm Filter
		HA21BMP1080322	Permeable/ Porous Pavement
		HA21BMP1080321	Underground Storage
Aberdeen Outdoor Power Equipment Addition	07/09/20	HA21BMP1080272	Permeable/ Porous Pavement
Addie Estates Lots 4-10	04/02/21	HA21BMP1080215	Drywell
		HA21BMP1080216	Drywell
		HA21BMP1080217	Drywell
		HA21BMP1080323	Drywell
		HA21BMP1080213	Grass Swale / Channel
Andys Meadow Lot 5 Only	07/09/20	HA21BMP1080263	Drywell
Andys Meadow Lot 7 Only	10/08/20	HA21BMP1080264	Drywell
Apple Tree Orchard	11/20/20	HA21BMP1080202	Detention Structure(Dry Pond)
		HA21BMP1080203	Bio-swale
		HA21BMP1080197	Micro-Bioretenion
Beech Creek Phase 1 - Final As-Built	05/10/21	HA21BMP1080196	P-2 Wet Pond
Bel Air Impoundment And Intake Facility	12/14/20	HA21BMP1080318	Recharge Facility
		HA21BMP1080319	Rainwater Harvesting
Benedict Lands Of Lot 1	08/17/20	HA21BMP1080276	Drywell
Bynum Road & Watertower Way Roundabout	10/15/20	HA21BMP1080283	Bio-swale

		HA21BMP1080284	Bio-swale
		HA21BMP1080285	Bio-swale
Cedar Church Estates Lot 2	07/09/20	HA21BMP1080209	Drywell
		HA21BMP1080208	Grass Swale / Channel
Clorox Company Truck Entr. Widening & Parking Lot Exp.	01/21/21	HA21BMP1080245	Bio-swale
Eastgate Phase 1 Building A	08/11/20	HA21BMP1080327	Micro-Bioretenention
		HA21BMP1080335	Micro-Bioretenention
		HA21BMP1080332	Bioretenention
		HA21BMP1080343	Surface Sand Filter
		HA21BMP1080347	Surface Sand Filter
		HA21BMP1080345	Infiltration Basin
		HA21BMP1080346	Infiltration Basin
		HA21BMP1080346	Infiltration Basin
Encore At Glenwood - Final As-Built	10/26/20	HA21BMP1080342	Micro-pool Extended Detention
Fallston Recreational Complex Storage Building	08/24/20	HA21BMP1080288	Drywell
Fox Meadows Complex	10/08/20	HA21BMP1080514	Grass Swale / Channel
Foxhall Equine Rehabilitation Center	01/21/21	HA21BMP1080259	Micro-Bioretenention
Grace Assembly of God Building Addition 2303 Churchville Rd	08/31/20	HA21BMP1080248	Micro-Bioretenention
Grays Run Overlook Final As-Built	08/10/20	HA21BMP1080205	P2 Wet Pond
Harford Center Parking Expansion	12/14/20	HA21BMP1080289	Bio-swale
		HA21BMP1080290	Detention Structure(Dry Pond)
		HA21BMP1080291	Permeable/ Porous Pavement
Harford County AG Center	12/18/20	HA21BMP1080303	Bio-swale
		HA21BMP1080301	Detention Structure (Dry Pond)
		HA21BMP1080304	Detention Structure (Dry Pond)
		HA21BMP1080302	Micro-Bioretenention

Harford County AG Center Open Air Market	09/23/20	HA21BMP1080310	Bio-swale
		HA21BMP1080311	Bio-swale
Harford Dale South - Revised		HA21BMP1080207	Drywell
Harlans Glance Lot 12	11/04/20	HA21BMP1080271	Drywell
		HA21BMP1080326	Rooftop Disconnect
		HA21BMP1080325	Non-Rooftop Disconnect
		HA21BMP1080270	Grass Swale / Channel
		HA21BMP1080324	Grass Swale / Channel
Harlans Glance Peery Dr Cul-de-sac	09/21/20	HA21BMP1080195	Grass Swale / Channel
HCC - Edgewood Hall Addtion	09/01/20	HA21BMP1080212	Permeable/ Porous Pavement
		HA21BMP1080211	Drywell
Jarrettsville Veterinary Expansion	01/21/21	HA21BMP1080246	Micro-Bioretenction
		HA21BMP1080204	Detention Structure (Dry Pond)
MA & PA Edgeley Grove Trail	03/02/21	HA21BMP1080292	Grass Swale / Channel
		HA21BMP1080293	Grass Swale / Channel
		HA21BMP1080295	Grass Swale / Channel
Magness Overlook Phase 2 Microbioretenction Area A	11/30/20	HA21BMP1080235	Micro-Bioretenction
Magness Overlook Phase 2 Microbioretenction Area B	11/30/20	HA21BMP1080236	Micro-Bioretenction
Magness Overlook Phase 2 Microbioretenction Area C	11/30/20	HA21BMP1080238	Micro-Bioretenction
Magness Overlook Phase 2 Microbioretenction Area D	11/30/20	HA21BMP1080238	Micro-Bioretenction
Magness Overlook Phase 2 Microbioretenction Area E	11/30/20	HA21BMP1080239	Micro-Bioretenction
Magness Overlook Phase 2 Microbioretenction Area F	11/30/20	HA21BMP1080239	Micro-Bioretenction
Magness Overlook Phase 2 Microbioretenction Area G	11/30/20	HA21BMP1080241	Micro-Bioretenction
Magness Overlook Phase 2 Microbioretenction Area H	11/30/20	HA21BMP1080242	Micro-Bioretenction
Magness Overlook Phase 2 Pond 1 - Final As-Built	02/26/21	HA21BMP1080229	Detention Structure (Dry Pond)
Magness Overlook Phase 2 Pond 2	02/26/21	HA21BMP1080243	Detention Structure (Dry Pond)

Magness Overlook Phases 2 & 3 Bioswale 1	02/05/21	HA21BMP1080230	Bio-swale
Magness Overlook Phases 2 & 3 Bioswale 2	02/05/21	HA21BMP1080231	Bio-swale
Magness Overlook Phases 2 & 3 Bioswale 3	02/05/21	HA21BMP1080232	Bio-swale
Magness Overlook Phases 2 & 3 Bioswale 4	02/05/21	HA21BMP1080233	Bio-swale
Magness Overlook Phases 2 & 3 Bioswale 5	02/05/21	HA21BMP1080234	Bio-swale
Magness Overlook Phases 2 & 3 Drywells	02/05/21	HA21BMP1080349	Drywell
		HA21BMP1080350	Drywell
		HA21BMP1080351	Drywell
		HA21BMP1080352	Drywell
		HA21BMP1080353	Drywell
		HA21BMP1080354	Drywell
		HA21BMP1080355	Drywell
		HA21BMP1080356	Drywell
		HA21BMP1080357	Drywell
		HA21BMP1080358	Drywell
		HA21BMP1080359	Drywell
		HA21BMP1080360	Drywell
		HA21BMP1080361	Drywell
		HA21BMP1080362	Drywell
		HA21BMP1080363	Drywell
		HA21BMP1080364	Drywell
		HA21BMP1080365	Drywell
		HA21BMP1080366	Drywell
		HA21BMP1080367	Drywell
		HA21BMP1080368	Drywell
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		HA21BMP1080370	Drywell
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		HA21BMP1080374	Drywell
		HA21BMP1080375	Drywell
		HA21BMP1080376	Drywell
		HA21BMP1080377	Drywell
		HA21BMP1080378	Drywell
		HA21BMP1080379	Drywell
		HA21BMP1080407	Drywell
		HA21BMP1080439	Drywell
		HA21BMP1080465	Drywell
		HA21BMP1080510	Drywell
		HA21BMP1080514	Drywell
Mariner Point Park Canoe Launch	04/29/21	HA21BMP1080317	Bioretention
McDonalds 1 Red Pump Road	04/29/21	HA21BMP1080320	Underground Sanf Filter Box
Miracle League Field	09/08/20	HA21BMP1080308	Micro-Bioretention
		HA21BMP1080309	Micro-Bioretention
Perryman Generator Pad	11/20/20	HA21BMP1080265	Non-Rooftop Disconnect
Plumtree Run At Tollgate Road SWM Pocket Pond	08/10/20	HA21BMP1080297	Pocket Pond
Primrose Daycare 2219 Old Emmorton Road	12/14/20	HA21BMP1080249	Micro-Bioretention
		HA21BMP1080252	Bio-swale
Riverwoods At Tollgate Phase 2 Lot 3B Apartments	07/28/20	HA21BMP1080268	Micro-Bioretention
Robinson Mill Road Bridge #154 Replacement	12/14/20	HA21BMP1080298	Bio-swale
Sherwood Lane Property Lot 1	07/28/20	HA21BMP1080305	Detention Structure (Dry Pond)

Songbird Woods - Sewell Rd	01/05/21	HA21BMP1080218	Micro-Bioretentation
		HA21BMP1080219	Micro-Bioretentation
		HA21BMP1080220	Bio-swale
Tindilia Property Lot 5C	07/17/20	HA21BMP1080274	Drywell
		HA21BMP1080275	Rooftop Disconnect
		HA21BMP1080273	Non-Rooftop Disconnect
Trimble Road Business Park Lot 4	11/20/20	HA21BMP1080256	Bio-swale
		HA21BMP1080257	Bio-swale
		HA21BMP1080253	Submerged Gravel Wetland
		HA21BMP1080254	Submerged Gravel Wetland
		HA21BMP1080255	Submerged Gravel Wetland
		HA21BMP1080258	Submerged Gravel Wetland
Unfried, Janet Lot 1	01/21/21	HA21BMP1080278	Drywell
		HA21BMP1080277	Bio-swale
Unfried, Janet Lot 5	03/15/21	HA21BMP1080313	Drywell
		HA21BMP1080312	Grass Swale / Channel
US Fresh Meat Market 1513-1515 S. Philadelphia Blvd	04/29/21	HA21BMP1080266	Focal Point System
		HA21BMP1080267	Focal Point System
Warfield, David Lot 2 Only Rock Spring Rd	11/04/20	HA21BMP1080306	Drywell
		HA21BMP1080307	Non-Rooftop Disconnect

Stormwater Management Waiver, Exemptions, Fees in Lieu

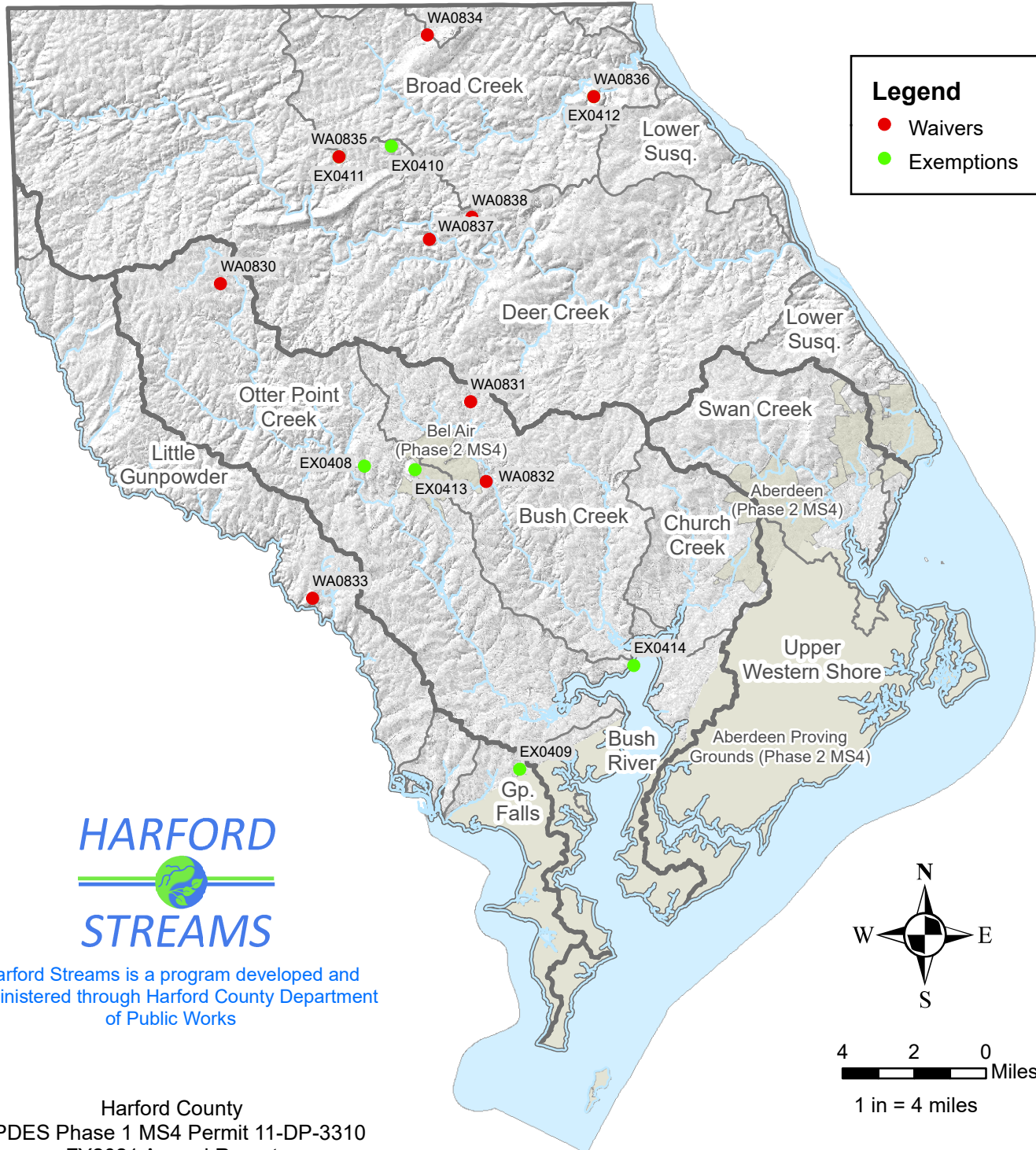
Appendix C3

Harford County, MD Department of Public Works Watershed Protection and Restoration

Stormwater Approvals (July 1, 2020 - June 30, 2021)



Barry Glassman
County Executive



Appendix C3

Harford County Stormwater Management Waivers between 7/1/2020 and 6/30/2021

site	location	submit date	approval date	watershed	easting	northing	quantity	quality	ID
BGE ROCK RIDGE DUCT BANK PROJECT	TRANSMISSION LINE ALONG W JARRETTSVILLE RD AND GOING	6/29/2020	7/13/2020	021307031134	1464757	708038	W4	W4	WA0830
BORROW AREA LANDS OF WHITEFORD LLC	MD-165 AND MD-136	11/4/2020	11/20/2020	021202050343	1495199	744584	W4	W4	WA0834
BROAD CREEK BOY SCOUT CAMP SAFFRAN	1929 SUSQUENHANNA HALL RD, WHITEFORD, MD 21160	3/18/2021	5/13/2021	021202050339	1519734	735559	W5	W5	WA0836
C. MILTON WRIGHT HIGH SCHOOL STREAM RESTORATION	1301 NORTH FOUNTAIN GREEN ROAD	6/6/2020	7/16/2020	021307041131	1501598	690676	W4	W4	WA0831
COLUMBIA GAS TRANSMISSION MPID 208285 LINE MA ABS 242724	NORTH OF WALTERS MILL RD AND WEST OF SHAWNEE DR	4/8/2021	5/20/2021	021202020324	1495499	714523	W5	W5	WA0837
COLUMBIA GAS TRANSMISSION MPID 208286 LINE MA ABS 249690	SOUTH OF BOYD ROAD AND WEST OF BRINGAR ROAD	4/20/2021	5/20/2021	021202020324	1501774	717815	W5	W5	WA0838
LEHNER PROPERTY RECKORD ROAD AND HARFORD ROAD	RECKORD ROAD AND HARFORD ROAD	10/21/2020	11/13/2020	021308040298	1478305	661791	W4	W4	WA0833
ROCKS COMMUNICATION SITE UTILITY WAIVER	217 DAVIS ROAD, STREET HARFORD COUNTY, MD 21154	12/23/2021	1/13/2021	021202020324	1482190	726705	W5	W5	WA0835
SUNNY VIEW ROAD STREAM REHABILITATION PROJECT	RING FACTORY ROAD NEAR FALLEN STONE COURT	7/9/2020	7/16/2020	021307041131	1503873	678974	W4	W4	WA0832

1 Waiver Types

- W1 Less than 10% increase (1984 regulations)
- W2 Completely surrounded by existing stormdrain (1984 regulation)
- W3 Provisions to control direct outfall to tidal water
- W4 No increase in impervious cover (2000 regulations)
- W5 Underground Utilities (2000 regulations)

* 1984 regulations valid 9/1984 - 1/2002

* 2000 regulations valid 2/2002 - present

Appendix C3

Harford County Stormwater Management Exemptions between 7/1/2020 and 6/30/2021

site	location	submit date	approval date	watershed	easting	northing	type	ID
1810 NUTTAL AVENUE	1810 NUTTAL AVENUE	11/23/2020	12/2/2020	021308010293	1508815	636675	E3	EX0409
BRENTWOOD PARK SEWAGE PUMPING STATION IMPROVEMENTS	1021 RED PUMP ROAD	6/25/2020	7/16/2020	021307031132	1485945	681227	E3	EX0408
BROADCREEK CAMP SAFFRAN WASTEWATER TREATMENT SYSTEM	1929 SUSQUEHANNA HALL RD, WHITEFORD, MD 21160	3/12/2021	5/10/2021	021202050339	1519735	735560	E3	EX0412
BUSHRIVER YACHT CLUB, 40002 EAST BAKER AVENUE	4001 EAST BAKER AVENUE, ABINGDON, MD, 21009	4/11/2021	5/26/2021	021307011127	1525612	651937	E3	EX0414
CATHERINE STREET (500) LIRIOD, LLC	500 CATHERINE ST, BEL AIR, MD, 21014	4/20/2021	5/14/2021	021307031132	1493406	680725	E3	EX0413
FALLING BRANCH BREWERY	805 HIGHLAND ROAD, STREET, MD	12/10/2020	12/16/2020	021202020324	1489913	728233	E3	EX0410
ROCKS COMMUNICATION SITE UTILITY WAIVER	217 DAVIS ROAD, STREET HARFORD COUNTY, MD 21154	12/23/2021	1/13/2021	021202020324	1482191	726706	E3	EX0411

1 Exemption Types

- E1 Agricultural Land Management
- E2 Additions or Modifications to single family residences
- E3 Developments that disturb less than 5,000 SQ FT
- E4 Land development regulated under State laws
- E5 Single residences on lots greater than 2 acres (1984 regulations)

* 1984 regulations valid 9/1984 - 1/2002